

Applicant : Brandon A. Bartling
Serial No. : 10/743,585
Filed : December 22, 2003
Art Unit: 1745
Examiner: Gregg Cantelmo

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CLAIM AMENDMENTS

1. (currently amended) A metal-air cell comprising:
at least one air entry port along an exterior surface of the cell; and
a tab system that covers the at least one air entry port, the tab system comprising at least a first polymer layer and a second polymer layer, and a first adhesive layer disposed between the exterior surface of the metal air cell and the first polymer layer, and a second adhesive layer between the first polymer layer and the second polymer layer, wherein:
the first polymer layer and the second polymer layer are both biaxially oriented;
the tab system has a loss stiffness that is from about 25,000 N/m to less than about 55,000 N/m at 20 °C to 25 °C; and
the tab system has an oxygen permeability of from about 50 (cm³ x m x mm Hg) / (m² x day) to about 150 (cm³ x m x mm Hg) / (m² x day); wherein and
the cell comprises zero added mercury.
2. (original) The metal-air cell of claim 1 wherein the tab system has a peel strength that ranges from about 6.5 psi to about 11 psi.
3. (original) The metal-air cell of claim 1 wherein the external surface of the cell having at least one air entry port comprises a curved surface.
4. (cancelled)
5. (original) The metal-air cell of claim 1 wherein the tab system has a loss stiffness that ranges from about 25,000 N/m to about 45,000 N/m at 20 °C to 25 °C and is less than about 35,000 N/m at 60 °C.
6. (original) The metal-air cell of claim 1 wherein the cell comprises an active material that comprises zinc and an electrolyte that comprises potassium hydroxide.
7. (cancelled)

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8. (currently amended) The metal-air cell of claim 6 wherein the cell has an open circuit voltage that ranges from about 1.18 volts to about 1.37 volts.
9. (original) The metal-air cell of claim 1 wherein the cell is generally cylindrical in shape.
10. (original) The metal-air cell of claim 9 wherein the cell is a button-type cell.
11. (original) The metal-air cell of claim 1 wherein the cell is generally prismatic in shape.
12. (original) The metal-air cell of claim 1 wherein the first polymer layer comprises polypropylene.
13. (original) The metal-air cell of claim 12 wherein the first polymer layer is biaxially oriented such that a ratio of tensile stress in a machine direction to tensile stress in a transverse direction ranges from about 1:3 to about 3:1.
14. (original) The metal-air cell of claim 12 wherein a thickness of the first polymer layer ranges from about 0.003 inches to about 0.005 inches.
15. (currently amended) The metal-air cell of claim 12 wherein the first adhesive layer is removable from the cell with no visible residue remaining on the cell.
16. (currently amended) The metal-air cell of claim 15 wherein the first adhesive layer comprises an acrylic adhesive.
17. (cancelled)

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18. (currently amended) The metal-air cell of ~~claim 17~~ claim 33 wherein the second polymer layer ~~comprises polypropylene, the second polymer layer being~~ is biaxially oriented such that a ratio of tensile stress in a machine direction to tensile stress in a transverse direction ranges from about 1:3 to about 3:1.

19. (currently amended) A metal-air cell comprising:
at least one air entry port along an exterior surface of the cell;
a tab system that covers the at least one air entry port, the tab system comprising:
a first polymer layer; and
a second polymer layer;
~~an~~ a first adhesive layer disposed between the external surface of the cell and the first polymer layer;
a second adhesive layer between the first polymer layer and the second polymer layer; wherein
the first polymer layer and the second polymer layer are both biaxially oriented;
the tab system has a loss stiffness that is from about 25,000 N/m to less than about 55,000 N/m at 20°C to 25 °C ~~and~~
the tab system has an average burst pressure of from about 43 psi to 60 psi;
the tab system has an oxygen permeability of from about 50 (cm³ x m x mm Hg) / (m² x day) to about 150 (cm³ x m x mm Hg) / (m² x day); and
the cell comprises zero added mercury.

20. (original) The metal-air cell of claim 19 wherein the external surface of the cell having at least one air entry port comprises a curved surface.

21. (cancelled)

22. (original) The metal-air cell of claim 19 wherein the tab system has a loss stiffness that ranges from about 25,000 N/m to about 45,000 N/m at 20 °C to 25 °C and is less than about 35,000 N/m at 60 °C.

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23. (currently amended) A metal-air cell comprising:
at least one air entry port along an exterior surface of the cell; and
a tab system that covers the at least one air entry port, the tab system comprising:
a first polymer layer; and
a second polymer layer;
~~an~~ a first adhesive layer disposed between the surface of the metal air cell and the
first polymer layer; and
a second adhesive layer between the first polymer layer and the second polymer
layer; wherein:
the first polymer layer and the second polymer layer are both biaxially oriented;
the tab system has a loss stiffness that is from about 25,000 N/m to less than about
55,000 N/m at 20°C to 25 °C, an average burst pressure of from about 43 psi to 60 psi, a
peel strength that ranges from about 6.5 psi to about 11 psi and an oxygen permeability of
from about 50 (cm³ x m x mm Hg) / (m² x day) to about 150 (cm³ x m x mm Hg) / (m² x
day); and
the cell comprises zero added mercury.
24. (original) The metal-air cell of claim 23 wherein the external surface of the cell
having at least one air entry port comprises a curved surface.
25. (cancelled)
26. (original) The metal-air cell of claim 23 wherein the tab system has a loss
stiffness that ranges from about 25,000 N/m to about 45,000 N/m at 20 °C to 25 °C and is less
than about 35,000 N/m at 60 °C.
27. (currently amended) The metal-air cell of claim 23 wherein the first polymer
layer comprises polypropylene and is biaxially oriented such that a ratio of tensile stress in a
machine direction to tensile stress in a transverse direction ranges from about 1:3 to about 3:1.

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28. (currently amended) The metal-air cell of claim 27 wherein the ~~tab system~~ comprises a second polymer layer that comprises polypropylene and is biaxially oriented such that a ratio of tensile stress in a machine direction to tensile stress in a transverse direction ranges from about 1:3 to about 3:1.

29. (currently amended) A metal-air cell comprising:
at least one air entry port along an exterior surface of the cell;
a tab system that covers the at least one air entry port, the tab system comprising:
a first polymer layer; ~~and~~
a second polymer layer;
~~an~~ a first adhesive layer disposed between the external surface of the metal air cell and the first polymer layer; and
a second adhesive layer between the first polymer layer and the second polymer layer; wherein:
the first polymer layer and the second polymer layer are both biaxially oriented;
the tab system has a loss stiffness that is from about 25,000 N/m to less than about 55,000 N/m at 20°C to 25 °C, an average burst pressure of from about 43 psi to 60 psi, a peel strength that ranges from about 6.5 psi to about 11 psi, and an oxygen permeability of from about 50 (cm³ x m x mm Hg) / (m² x day) to about 150 (cm³ x m x mm Hg) / (m² x day);
the cell comprises an active material which comprises zinc and an electrolyte that comprises potassium hydroxide and has an open circuit voltage that ranges from about 1.18 volts to about 1.37 volts; and
the cell comprises zero added mercury.

30. (cancelled)

31. (original) The metal-air cell of claim 29 wherein the tab system has a loss stiffness that ranges from about 25,000 N/m to about 45,000 N/m at 20 °C to 25 °C and is less than about 35,000 N/m at 60 °C.

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32. (currently amended) The metal-air cell of claim 29 wherein:
~~the tab system comprises a second polymer layer;~~
~~the first polymer layer and the second polymer layer both comprise polypropylene;~~ the first polymer layer and the second polymer layer are both biaxially oriented such that a ratio of tensile stress in a machine direction to tensile stress in a transverse direction ranges from about 1:3 to about 3:1; and
~~the tab system comprises a second adhesive layer between the first polymer layer and the second polymer layer.~~
33. (new) The metal-air cell of claim 1 wherein the second polymer layer comprises polypropylene.
34. (new) The metal-air cell of claim 1 wherein both the first polymer layer and the second polymer layer comprise polypropylene.
35. (new) The metal-air cell of claim 34 wherein the second adhesive comprises an acrylic adhesive.
36. (new) The metal-air cell of claim 1 wherein the second adhesive comprises an acrylic adhesive.
37. (new) The metal-air cell of claim 19 wherein both the first polymer layer and the second polymer layer comprise polypropylene.
38. (new) The metal-air cell of claim 37 wherein both the second adhesive comprises an acrylic adhesive.